

AMENDMENTS TO THE CLAIMS

In the claims:

1. (Currently amended) A semiconductor structure comprising: a substrate, a ~~$\text{Sn}_x\text{Ge}_{1-x}$~~ $\text{Sn}_z\text{Ge}_{1-z}$ layer formed over the substrate, and an essentially single-phase ~~Ge-Sn-Si~~ $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$ layer formed over the ~~$\text{Sn}_x\text{Ge}_{1-x}$~~ $\text{Sn}_z\text{Ge}_{1-z}$ layer.
2. (Original) The semiconductor structure of claim 1 wherein the substrate comprises silicon.
3. (Original) A method for synthesizing a compound having the molecular formula $\text{H}_3\text{Si-GeH}_3$, the method comprising combining $\text{H}_3\text{SiO}_3\text{SCF}_3$ with KGeH_3 under conditions whereby $\text{H}_3\text{Si-GeH}_3$ is obtained.
4. (New) The structure of claim 1, wherein z is about 0.01 to about 0.05.
5. (New) The structure of claim 1, wherein x is about 0.01 to about 0.25; and y is about 0.01 to about 0.11.
6. (New) The structure of claim 1, wherein x is about 0.01 to about 0.25; y is about 0.01 to about 0.11; z is about 0.01 to about 0.05; and the substrate comprises silicon.
7. (New) The structure of claim 1, wherein the $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$ layer is strained.
8. (New) The structure of claim 1, wherein the $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$ layer is relaxed.

9. (New) A method to prepare the semiconductor structure according to claim 1, comprising the steps of,
 providing a substrate;
 depositing a $\text{Sn}_z\text{Ge}_{1-z}$ layer over the substrate; and
 depositing a $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$ layer over the $\text{Sn}_z\text{Ge}_{1-z}$ layer.
10. (New) The method of claim 9, wherein the $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$ layer is deposited by precursor chemical vapor deposition, wherein the precursor chemical vapor comprises SnD_4 and H_3SiGeH_3 .
11. (New) The method of claim 9, wherein the $\text{Sn}_z\text{Ge}_{1-z}$ layer is deposited by precursor chemical vapor deposition, wherein the precursor chemical vapor comprises SnD_4 and Ge_2H_6 .
12. (New) The method of claim 9, wherein the substrate comprises silicon.
13. (New) The method of claim 9, further comprising the step of annealing the $\text{Sn}_z\text{Ge}_{1-z}$ layer prior to depositing the $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$ layer.
14. (New) The method of claim 9, wherein z is about 0.01 to about 0.05.
15. (New) The method of claim 9, wherein x is about 0.01 to about 0.25; and y is about 0.01 to about 0.11.
16. (New) The method of claim 9, wherein x is about 0.01 to about 0.25; y is about 0.01 to about 0.11; z is about 0.01 to about 0.05; and the substrate comprises silicon.

17. (New) The method of claim 9, wherein the $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$ layer is deposited at a temperature of about 310°C to about 375°C.

18. (New) The method of claim 3, wherein the $\text{H}_3\text{SiO}_3\text{SCF}_3$ and KGeH_3 are combined at about -60°C.

19. (New) An alloy of the formula, $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$, wherein x is about 0.01 to about 0.25 and y is about 0.01 to about 0.11.

20. (New) The alloy of Claim 19, wherein x is about 0.13 to about 0.20.

21. (New) The alloy of Claim 20, wherein y is about 0.07 to about 0.11.

22. (New) The alloy of Claim 20, wherein y is about 0.01 to about 0.06.

23. (New) A semiconductor structure comprising: a substrate, a $\text{Sn}_z\text{Ge}_{1-z}$ layer formed over the substrate, and a layer of the alloy of Claim 19 formed over the $\text{Sn}_z\text{Ge}_{1-z}$ layer.

24. (New) The semiconductor structure of claim 23 wherein the substrate comprises silicon.

25. (New) The semiconductor structure of Claim 1 wherein the $\text{Sn}_z\text{Ge}_{1-z}$ and $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$ layers are lattice-matched.

26. (New) The semiconductor structure of Claim 23 wherein the $\text{Sn}_z\text{Ge}_{1-z}$ and $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$ layers are lattice-matched.

27. (New) A structure comprising: a $\text{Sn}_z\text{Ge}_{1-z}$ layer and a layer of the alloy of Claim 19 formed over the $\text{Sn}_z\text{Ge}_{1-z}$ layer.